

CLAIMS

- 1 1. A device comprising:
2 a first layer;
3 an etch stop layer positioned over the first layer;
4 a second layer positioned over the etch stop layer;
5 a first trench positioned through the second layer, etch stop layer, and a portion of
6 the first layer.
- 1 2. A device, as defined in claim 1, wherein the etch stop layer is an oxide.
- 1 3. A device, as defined in claim 2, wherein the first layer is c-Si and the second
2 layer is amorphous silicon.
- 1 4. A device, as defined in claim 2, wherein the first layer is c-Si and the second
2 layer is epitaxial silicon.
- 1 5. A device, as defined in claim 2, wherein the first layer is low-k dielectric and
2 the second layer is an amorphous Si.
- 1 6. A device, as defined in claim 5, wherein k is between 1 and 3.9.
- 1 7. A device, as defined in claim 1, further comprising an intermediary layer
2 interposing the etch stop layer and first layer, the trench further extending through the
3 intermediary layer.
- 1 8. A device, as defined in claim 1, further comprising a second trench positioned
2 through the second layer, etch stop layer, and a portion of the first layer, wherein the
3 second trench has a shallower depth than the first trench.
- 1 9. A method for generating a first trench comprising:
2 depositing an etch stop film over a first layer, wherein the first layer is a c-Si
3 substrate;

4 depositing a second layer over the etch stop film;
5 depositing a first photomask layer over the second layer;
6 patterning the first photomask layer;
7 patterning the second layer according to the first photomask layer; and
8 patterning the etch stop layer;
9 removing the first photomask layer; and
10 patterning the first layer according to the etch stop layer.

1 10. A method, as defined in claim 9, wherein the etch stop film is an oxide.

1 11. A method, as defined in claim 9, wherein the first layer is a c-Si substrate and
2 the second layer is amorphous silicon.

1 12. A method, as defined in claim 11, wherein patterning the amorphous silicon
2 includes etching with chlorine based etch chemistry.

1 13. A method, as defined in claim 11, wherein the first layer is a c-Si substrate
2 and the second layer is epitaxial silicon.

1 14. A method, as defined in claim 9, wherein patterning the etch stop layer
2 includes patterning with wet etch chemistry.

1 15. A method, as defined in claim 9, wherein patterning the etch stop layer
2 includes patterning with dry etch chemistry.

1 16. A method, as defined in claim 9, wherein patterning the amorphous silicon
2 includes optical endpointing to determine when the etch reaches the etch stop.

1 17. A method, as defined in claim 16, wherein optical endpointing includes
2 applying optical emission spectra.

1 18. A method, as defined in claim 16, wherein optical endpointing includes
2 applying interferometry.

1 19. A method, as defined in claim 9, further comprising:
2 depositing a second photomask layer;
3 patterning the second photomask layer;
4 patterning the second layer according to the second photomask layer; and
5 etching the first layer according to the etch stop layer to define an additional
6 trench, wherein the additional trench has a shallower depth than the first trench.

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